

CLAIMS

Insert A 1. A throttle valve control device, in which a throttle valve (1) for controlling an amount of intake air of an internal combustion engine is operated by an electric actuator (4), which comprises:

a movable member (3), provided to the throttle valve (1), for transmitting torque produced by the electric actuator (4);

10 a contacting member (5) for coming into contact with said movable member (3) at a predetermined small opening of the throttle valve (1), when said movable member (3) moves the throttle valve (1) in the closing direction from a full open position;

15 a spring (6), arranged between said movable member (3) and said contacting member (5), for producing force in such a manner that said movable member (3) and said contacting member (5) pull against each other;

20 a stopper (103) for stopping the movement of said contacting member (5) at the predetermined small opening of the throttle valve (1), when said contacting member (5) moves in the opening direction from a full close position of the throttle valve (1); and

25 another spring (7) for producing force to energize said contacting member (5) to engage with said stopper (103).

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2. A throttle valve control device according to claim 1, wherein bearing members (5a, 5c) used for movement of said contacting member (5) are rotatably supported by said movable member (3) fixed to the throttle valve (1).

3. A throttle valve control device according to claim 2, wherein a member (3b) for rotatably supporting said bearing members (5a, 5c) used for movement of said contacting member (5) is integrated with said movable member (3).

4. A throttle valve control device according to claim 1, wherein said another spring (7) is an extension spring.

5. A throttle valve control device according to claim 1, wherein said movable member (3) has a hollow portion, in which said spring (6) is accommodated.

6. A throttle valve control device, in which a throttle valve (1) for controlling an amount of intake air of an internal combustion engine is operated by an electric actuator (4), which comprises:

a movable member (3), provided to the throttle valve (1), for transmitting torque produced by the electric actuator (4); said movable member (3) being of a cylindrical form having a diameter larger than the axial length thereof,

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3ms. a1) a spring, arranged inside the cylindrical portion of said movable member (3), for energizing the throttle valve (1) in the closing direction from a full open position, and

5 gear (3h) being formed on the outer periphery of the cylindrical portion and the output of the electric actuator (4) being transmitted to open or close the throttle valve (1) through said gear (3h).

10 7. A throttle valve control device according to claim 6, wherein said spring (6) arranged inside said movable member (3) is a spiral spring.

15 8. A throttle valve control device according to claim 7, wherein a hook portion (3a) for retaining an outside end (6a) of said spiral spring (6) is provided on said movable member (3).

20 9. A throttle valve control device, in which a throttle valve (1) for controlling an amount of intake air of an internal combustion engine is operated by an electric actuator (4), which comprises a rotating angle sensor (20) for detecting an opening angle of the throttle valve (1);

25 wherein at least a part of the surfaces of a case accommodating said angle sensor (20) is formed by a main body (100) of the throttle valve device, in which an intake air path is formed, and the remaining part of the surfaces

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are formed by a housing of said angle sensor (20), whereby the main body of the throttle valve device and the case of the angle sensor (20) are integrated.

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